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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/817,731	03/26/2001	Lars Johan Persson	15685P075	9458

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EXAMINER

GANDHI, DIPAKKUMAR B

ART UNIT PAPER NUMBER

2138

DATE MAILED: 04/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	09/817,731		PERSSON ET AL.	
	<b>Examiner</b>		<b>Art Unit</b>	
	Dipakkumar Gandhi		2138	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 10 January 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-65 is/are pending in the application.
- 4a) Of the above claim(s) 1-40 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 41-65 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 June 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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***Response to Amendment***

1. Applicants' request for reconsideration filed on 1/10/2006 has been reviewed.
2. The amendment filed on 1/10/2006 has been entered, including amended claims.
3. Applicants' arguments filed on 1/10/2006 have been fully considered but they are not persuasive.
4. The applicants contend, "Lundby et al. and Anvari references fail to disclose or suggest

introducing additional diversity into a wireless communication link in response to determining an effective signal strength of a signal is insufficient, as recited in claim 41. The signals discussed in the references assume a certain diversity scheme with their signals, and those diversity schemes remain fixed."

The examiner disagrees and would like to point out that Lundby et al. teach that antenna transmit diversity as well as multi-carrier transmission are promising new technologies that improve transmission resistance to fading by offering space and/or frequency diversity. In the antenna transmit diversity case for example, the data to be transmitted is encoded into symbols, which are then distributed among the antennas and transmitted (col. 3, lines 21-27, Lundby et al.). Lundby et al. also teach providing additional diversity in the transmission signal through space, time, frequency or code space (col. 3, lines 35-36, Lundby et al.). Thus Lundby et al. teach introducing additional diversity into a wireless communication link in response to determining effective signal strength of a signal is insufficient, as recited in claim 41.

5. The applicants contend, "As per claim 42, Lundby et al. teach that a signal is prepared for transmission, and then processed to transmitted with diversity. Thus, diversity is "introduced" into the signal. The cited references do not teach or suggest that signals are transmitted with a particular diversity scheme, which is then changed to introduce additional diversity into the signal. Claim 42 refers to providing a signal with a diversity level, and dynamically introducing additional diversity."

The examiner disagrees and would like to mention that Lundby et al. teach that many techniques have been proposed for mitigating mutual interference between signals transmitted from the different antennas. Such techniques include delay transmit diversity, orthogonal transmit diversity (OTD), time switched transmit diversity (TSTD), time delayed transmit diversity (TDTD), and multi-carrier transmit diversity (MCTD). Each of these methods shares with the others a common goal of providing additional diversity in the transmitted signal through space, time, frequency or code space (col. 3, lines 28-36, Lundby et al.).

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Thus Lundby et al. teach dynamically introducing additional diversity on the wireless communication link as recited in claim 42.

6. The applicants contend, "Claims 55 and 58 are independent and recite limitations similarly directed to the limitations discussed above and these claims are nonobvious over the cited references." The examiner disagrees and would like to point out that claims 55 and 58 recite limitations similar to claims 41 and 42 and are rejected for the same reasons mentioned above.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lundby et al. (US 6,356,528 B1) in view of Anvari (US 5,461,646).

As per claim 41, Lundby et al. teach a method comprising: determining that an effective signal strength of a signal on a wireless communication link using signal diversity in one or more of the space, time or frequency domains is insufficient to provide a desired communication range; introducing signal diversity in an additional of the space, time, or frequency domains into the communication link in response to the determining to generate multiple signals corresponding to the signal on the communication link (col. 3, lines 21-24, lines 28-50, Lundby et al.).

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However Lundby et al. do not explicitly teach the specific use of selectively combining the decorrelated signals and demodulating the combined, decorrelated signals to generate a representation of the content of the signal.

Anvari in an analogous art teaches wireless communication (col. 1, line 16, Anvari). Anvari teaches a diversity technique ... uncorrelated multipath fadings (col. 2, 50-54, Anvari). Anvari also teaches the digital receiver 10 ... space diversity (fig. 1, col. 4, lines 32-34, Anvari). Anvari teaches a plurality of spaced apart antennas ... flat fading (col. 5, lines 5-10, Anvari). Anvari teaches that the converter 40 shown in FIG. 3 is a quadrature demodulator, which is used to convert the IF, signal to a complex baseband signal (fig. 3, col. 5, lines 59-62, Anvari).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Lundby et al.'s patent with the teachings of Anvari by including an additional step of selectively combining the decorrelated signals and demodulating the combined, decorrelated signals to generate a representation of the content of the signal.

This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that it would provide the opportunity to combine the signals received from multiple signal paths and convert the combined signal to a baseband signal for a user.

10. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lundby et al. (US 6,356,528 B1) in view of Anvari (US 5,461,646) and Tsujimoto (US 5,369,412). Please see the office action mailed on 10/19/2005 for details.

11. Claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lundby et al. (US 6,356,528 B1), Anvari (US 5,461,646) and Tsujimoto (US 5,369,412) as applied to claim 42 above, and further in view of Worthy (US 6,643,494 B1). Please see the office action mailed on 10/19/2005 for details.

12. Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lundby et al. (US 6,356,528 B1), Anvari (US 5,461,646) and Tsujimoto (US 5,369,412) as applied to claim 42 above, and

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further in view of Molloy et al. (US 6,591,382 B1). Please see the office action mailed on 10/19/2005 for details.

13. Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lundby et al. (US 6,356,528 B1), Anvari (US 5,461,646), Tsujimoto (US 5,369,412) and Molloy et al. (US 6,591,382 B1) as applied to claim 44 above, and further in view of Agrawal et al. (US 5,722,051). Please see the office action mailed on 10/19/2005 for details.

14. Claims 46, 47, 48, 49, 50, 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lundby et al. (US 6,356,528 B1), Anvari (US 5,461,646) and Tsujimoto (US 5,369,412) as applied to claim 42 above, and further in view of Chuang et al. (US 6,052,594) and Schuster et al. (US 6,170,075 B1). Please see the office action mailed on 10/19/2005 for details.

15. Claims 52, 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lundby et al. (US 6,356,528 B1), Anvari (US 5,461,646), Tsujimoto (US 5,369,412), Chuang et al. (US 6,052,594) and Schuster et al. (US 6,170,075 B1) as applied to claim 50 above, and further in view of Altman et al. (US 3,195,049) and Balachandran et al. (US 5,881,105). Please see the office action mailed on 10/19/2005 for details.

16. Claim 53 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lundby et al. (US 6,356,528 B1), Anvari (US 5,461,646), Tsujimoto (US 5,369,412), Chuang et al. (US 6,052,594), Schuster et al. (US 6,170,075 B1), Altman et al. (US 3,195,049) and Balachandran et al. (US 5,881,105) as applied to claim 52 above, and further in view of Chin et al. (US 6,694,155 B1). Please see the office action mailed on 10/19/2005 for details.

17. Claim 55 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lundby et al. (US 6,356,528 B1) in view of Anvari (US 5,461,646), Tsujimoto (US 5,369,412) and Tolopka et al. (US 6,044,349). Please see the office action mailed on 10/19/2005 for details.

18. Claim 56 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lundby et al. (US 6,356,528 B1), Anvari (US 5,461,646), Tsujimoto (US 5,369,412) and Tolopka et al. (US 6,044,349) as applied to claim 55 above, and further in view of Molloy et al. (US 6,591,382 B1) and Agrawal et al. (US 5,722,051). Please see the office action mailed on 10/19/2005 for details.

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19. Claim 57 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lundby et al. (US 6,356,528 B1), Anvari (US 5,461,646), Tsujimoto (US 5,369,412) and Tolopka et al. (US 6,044,349) as applied to claim 55 above, and further in view of Chuang et al. (US 6,052,594) and Schuster et al. (US 6,170,075 B1). Please see the office action mailed on 10/19/2005 for details.
20. Claims 58, 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lundby et al. (US 6,356,528 B1) in view of Anvari (US 5,461,646), Tsujimoto (US 5,369,412) and Molloy et al. (US 6,591,382 B1). Please see the office action mailed on 10/19/2005 for details.
21. Claim 60 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lundby et al. (US 6,356,528 B1), Anvari (US 5,461,646), Tsujimoto (US 5,369,412) and Molloy et al. (US 6,591,382 B1) as applied to claim 58 above, and further in view of Agrawal et al. (US 5,722,051). Please see the office action mailed on 10/19/2005 for details.
22. Claims 61, 62, 63, 64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lundby et al. (US 6,356,528 B1), Anvari (US 5,461,646), Tsujimoto (US 5,369,412) and Molloy et al. (US 6,591,382 B1) as applied to claim 58 above, and further in view of Chuang et al. (US 6,052,594) and Schuster et al. (US 6,170,075 B1). Please see the office action mailed on 10/19/2005 for details.
23. Claim 65 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lundby et al. (US 6,356,528 B1), Anvari (US 5,461,646), Tsujimoto (US 5,369,412) and Molloy et al. (US 6,591,382 B1), Chuang et al. (US 6,052,594) and Schuster et al. (US 6,170,075 B1) as applied to claim 64 above, and further in view of Altman et al. (US 3,195,049) and Balachandran et al. (US 5,881,105). Please see the office action mailed on 10/19/2005 for details.

#### ***Conclusion***

24. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action

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is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.



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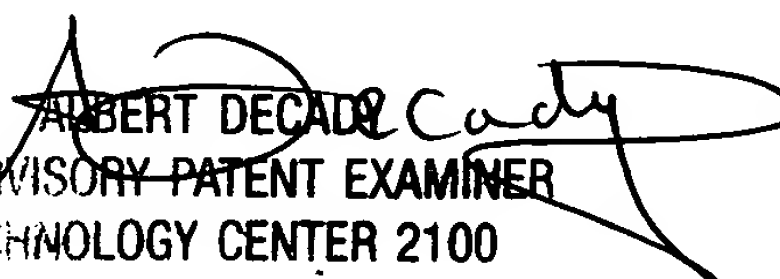
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dipakkumar Gandhi whose telephone number is 571-272-3822. The examiner can normally be reached on 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (571) 272-3819. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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